AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method for forming at least one opening in an insulating layer on a substrate while depositing a barrier layer on side walls of the opening without essentially depositing the barrier layer on a bottom of the opening, the method comprising the steps of:

subjecting the substrate to a plasma, the plasma being generated in a gaseous mixture comprising at least three components, the components comprising a first component for depositing the metal barrier layer on at least the side walls of the opening, a second component for forming an opening in the insulating layer, and a third component for removing the barrier layer being formed on the bottom of the opening, wherein the first component is selected from the group consisting of 1-methyl silane, 2-methyl silane, 3-methyl silane, 4-methyl-silane, a mixture of SiH_4 and N_2, a mixture of WF_6 and N_2, and combinations thereof, wherein the second component is selected from the group consisting of N_xO_y, $C_xF_yH_xO_u$, N_2/O_2 mixtures, N_2/H_2 mixtures, O_2, O_3, NH_3, CO, CO_2, CH_4, and combinations thereof, and wherein the third component comprises a chemical compound that forms a halogen ion or a halogen radical in the plasma;

etching the insulating layer with the plasma; and

depositing the barrier layer on the side walls of the opening with the plasma.

2. (Currently amended) A method as recited in claim 1, wherein the first component is selected from the group consisting of ~~1-methyl silane, 2-methyl silane,~~ 3-methyl silane~~,~~ and 4-methyl-silane~~, a mixture of SiH4 and N_2, a mixture of WF_6 and N_2, and combinations thereof~~.

3. (Currently amended) A method as recited in claim 1 wherein the second component is selected from the group consisting of ~~N_xO_y, $C_xF_yH_xO_u$,~~ N_2/O_2 mixtures, N_2/H_2 mixtures, and O_2~~, O_3, NH_3, CO, CO_2, CH_4, and combinations thereof~~.

4. (Currently amended) A method as recited in claim 1, wherein the third component ~~comprises a chemical compound that forms a halogen ion or a radical in the plasma~~ is selected from the group consisting of CF_4, CHF_3, CH_2F_2, CHF_3, and mixtures thereof.

5. (Currently amended) A method as recited in claim ~~4~~ 1, wherein the third component is selected from the group consisting of NF_3, SF_6, ~~F_2, ClF_3,~~ and mixtures thereof.

6. (Currently amended) A method as recited in claim 1, wherein the gaseous mixture further comprises an inert gas selected from the group consisting of Ar, He, N_2, and mixtures thereof.

7. (Original) A method as recited in claim 1, wherein the plasma is a continuous plasma.

8. (Original) A method as recited in claim 1, wherein the plasma is a pulsed plasma.

9. (Original) A method as recited in claim 1, wherein the barrier layer is a metal diffusion barrier layer.

10. (Currently amended) A method as recited in claim 9, wherein the barrier layer comprises hydrogenated silicon carbide.

11. (Original) A method as recited in claim 1, wherein the insulating layer comprises a porous material.

12. (Original) A method as recited in claim 1, wherein the insulating layer is an organic containing insulating layer.

13. (Original) A method as recited in claim 1, wherein the insulating layer is an inorganic containing insulating layer.

14. (Original) A method as recited in claim 1, wherein the opening is a via hole, the via hole extending through the insulating layer to an underlying conductive layer or to an underlying barrier layer.

15. (Original) A method as recited in claim 1, further comprising the steps of:

covering the insulating layer with a bilayer, the bilayer comprising a resist hard mask layer formed on the insulating layer and a resist layer formed on the hard mask layer; and

patterning the bilayer.

16-36. (Cancelled)